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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/728,700

12/05/2003

C. Roger Hickerson

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LSI LOGIC CORPORATION
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EXAMINER

DANG, KHANH

ART UNIT

PAPER NUMBER

2111

DATE MAILED: 09/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/728,700

Applicant(s)

HICKERSON ET AL.

Examiner

Khanh Dang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 18, 20-22, 24 and 26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 18, 20-22, 24 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Current Status

Applicants' filing of an RCE to enter an After-Final Amendment on 7/26/2006 is acknowledged.

Claims 10-17, 19, 23, and 25 have been cancelled.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 4, 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Heil et al. (Heil, 6,173,374).

As broadly drafted, these claims do not define any structure or step that differs from Heil.

With regard to claim 1, Heil discloses a method encapsulating a bus interface selecting request within a common transport message that facilitates usage with bus interface constructs, comprising: receiving a common transport message by a local host bus adapter (Heil discloses a local host bus adapter (HBA 117, Fig. 1, for example); a remote host bus adapter (HBA 126, Fig. 1, for example); and switching and routing means (Fiber Channel Backbone 211, Fig. 1, for example) for communicatively coupling the local host bus adapter (HBA 117, Fig. 1, for example) and the remote host bus adapter (HBA 126, Fig. 1, for example), wherein an I/O request from the host 100 transmitted via a PCI interface 115/116.5/200/230 and received by a local host bus adapter 117); modifying the common transport message in the local host bus adapter to contain a bus message passing request (the I/O request is then encapsulated in packet and transmitted via Fiber Channel Backbone 121); transmitting the modified common transport message from the local host bus adapter to a remote host bus adapter, the modified common transport message including an address, a command and data in SCSI format, wherein the modified common transport message is transmitted from the local host bus adapter to the remote host bus adapter via an external Ethernet link, the external Ethernet link directly, communicatively connecting a local software driver of the local host bus adapter to a remote software driver of the remote host bus adapter ((the encapsulated FC packet is transmitted to the remote host bus adapter 126. in Heil, it is clear that the local host bus adapter 117 is capable of managing the remote host adapter 126 via interface provided by the FC Backbone 121, Fiber Channel Chips 120/122. In particular, local host bus adapter 117 can be initialized

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as a directory manager to request and receive peer HBAs directory information (see flow chart of Fig. 4C and description thereof) or to demand directory information from peer HBAs (see flow chart of Fig. 4C and description thereof. Further, it is clear that host bus adapter 117/126 includes a bus interface message software driver and local bus interface message hardware and firmware. In particular, each HBA 117, 126 contains managing means which includes the "Distributed block I/O redirector driver software" 240, 331, the I/O shipping ISM 270, 340 and the I/O shipping HDM 280, 350. The I/O redirector software 240, 331 provides the means to allow the HBA 117, 126 to make the decision whether to satisfy a block I/O request locally or remotely. The I/O redirector 240, 331 has the means to search a directory, which stores the location of local and remote blocks within the cluster's drives. The directory is stored within HBA cache memory. The managing means coordinates the retrieval of data over a cluster with logically shared disks. Thus, it is clear that software drivers are provided for the local HBA and remote HBA. As noted above, Heil discloses a system for remote host bus adapter management, comprising: a local host bus adapter (HBA 117, Fig. 1, for example)); a remote host bus adapter (HBA 126, Fig. 1, for example); and switching and routing means (Fiber Channel Backbone 211, Fig. 1, for example) for communicatively coupling the local host bus adapter (HBA 117, Fig. 1, for example) and the remote host bus adapter (HBA 126, Fig. 1, for example). Fibre Channel uses the Gigabit Ethernet physical layer to provide both connection-oriented and connectionless services (see definition of Fiber Channel, previously cited). Note that Fibre Channel is a gigabit-speed network technology primarily used for storage networking. Fibre Channel

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is standardized in the T11 Technical Committee of the InterNational Committee for Information Technology Standards (INCITS), an American National Standard Institute–accredited standards committee. It started for use primarily in the supercomputer field, but has become the standard connection type for storage area networks in enterprise storage. Despite its name, Fibre Channel signaling can run on both twisted-pair copper wire and fiber optic cables. Fibre Channel Protocol (FCP) is the interface protocol of SCSI on the Fibre Channel. Thus, it is clear that the encapsulated or modified common transport message in Heil transmitted over the Fiber Channel include an address, a command, and data in SCSI format.

With regard to claim 2, it is clear that the FC Protocol used in Heil is in full compliant with Fiber Channel General Services Common Transport Protocol.

With regard to claim 4, it is clear that HBA management must include identification of bus type, since protocol and driver update is directly related to bus type of the HBA.

With regard to claim 6, it is clear that in Heil, the bus type is Fibre Channel (FC).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of the Fibre Channel Standards.

As discussed above, Heil discloses the claimed invention including the use a modified or encapsulated transport message transported over a Fibre Channel, and is in compliant with the Fibre Channel Protocol including the Fibre Channel General Service Common Transport Protocol.

Heil does not disclose specifically that the modified or encapsulated transport message transported over a Fibre Channel is in compliant with the Fibre Channel Protocol including the Fibre Channel General Service Common Transport Protocol, version 3.

However, version 3 is old and well-known as evidenced by the Fibre Channel Standards from Wikipedia as an improved version over previous versions of Fibre Channel Protocol.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use version 3 in Heil, as taught by the Fibre Channel Standards,

for the purpose of providing improvements over other older versions of the Fibre Channel Protocol.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of the Emulex SLI Architecture.

The difference between the claimed subject matter and that of Heil is the use of SAS bus for the HBA. However, the use of SAS is old and well-known as evidenced by Emulex SLI Architecture, previously cited. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ SAS in Heil, since the use of SAS bus is old and well-known as evidenced by Emulex SLI Architecture; and selecting SAS bus in Heil only involves ordinary skill in the art.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of the Infiniband Storage

The further difference between the claimed subject matter and that of Heil is the use of Infiniband bus for the HBA. However, the use of Infiniband bus is old and well-known as evidenced by Infiniband Storage, previously below. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Infiniband in Heil, since the use of Infiniband bus is old and well-known as evidenced by Infiniband Storage; and selecting Infiniband bus in Heil only involves ordinary skill in the art.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of Emulex HBAniware, as applied to claims 1-4, and 6 above, and further in view of the Emulex SLI Architecture.

The further difference between the claimed subject matter and that of Heil is the use of iSCSI bus for the HBA. However, the use of iSCSI is old and well-known as evidenced by Emulex SLI Architecture, previously cited. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ iSCSI in Heil, since the use of iSCSI bus is old and well-known as evidenced by Emulex SLI Architecture; and selecting iSCSI bus in Heil only involves ordinary skill in the art.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil further in view of the LSI Logic's Fusion-MPT.

The difference between the claimed subject matter and that of Heil is the use of Fusion-MPT for the bus message passing request.

However, the use of Fusion-MPT is old and well-known as evidenced by LSI Logic's Fusion-MPT. Fusion-MPT architecture encompasses LSI Logic's Fusion-MPT firmware architecture, LSI Logic's SCSI hardware architecture, LSI Logic's Fibre Channel hardware architecture, and the operating system level drivers that support these architectures. Fusion-MPT architecture has the unique feature of having a single device driver that supports both Fibre Channel and SCSI. LSI Logic's Fusion-MPT architecture is designed to support 64-bit architectures with 64-bit PCI and 64-bit PCI-X interfaces for high host side performance. Fusion-MPT architecture is modular and

readily extensible to other host interface architectures as they emerge. Fusion-MPT technology delivers higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Fusion-MPT for the bus message passing request in the host interface architecture of Heil, as taught by LSI Logic's Fusion-MPT, for the purpose of providing the HBA architecture of Heil with higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design.

Claims 18, 20-22, 24, and 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of the LSI's Fusion MPT.

With regard to claim 18, Heil discloses a method for managing a remote host bus adapter, comprising: acquiring a Peripheral Component Interconnect (PCI) message request (an I/O request from the host 100 transmitted via a PCI interface 115/116.5/200/230 and received by a local host bus adapter 117); encapsulating the PCI message request in a Fibre Channel (FC) packet (the I/O request is then encapsulated in packet and transmitted via Fiber Channel Backbone 121); and transmitting the encapsulated FC packet to a remote host bus adapter (the encapsulated FC packet is transmitted to the remote host bus adapter 126. in Heil, it is clear that the local host bus adapter 117 is capable of managing the remote host adapter 126 via interface provided by the FC Backbone 121, Fiber Channel Chips

120/122. In particular, local host bus adapter 117 can be initialized as a directory manager to request and receive peer HBAs directory information (see flow chart of Fig. 4C and description thereof) or to demand directory information from peer HBAs (see flow chart of Fig. 4C and description thereof). Further, it is clear that host bus adapter 117/126 includes a bus interface message software driver and local bus interface message hardware and firmware. In particular, each HBA 117, 126 contains managing means which includes the "Distributed block I/O redirector driver software" 240, 331, the I/O shipping ISM 270, 340 and the I/O shipping HDM 280, 350. The I/O redirector software 240, 331 provides the means to allow the HBA 117, 126 to make the decision whether to satisfy a block I/O request locally or remotely. The I/O redirector 240, 331 has the means to search a directory, which stores the location of local and remote blocks within the cluster's drives. The directory is stored within HBA cache memory. The managing means coordinates the retrieval of data over a cluster with logically shared disks. Thus, it is clear that software drivers are provided for the local HBA and remote HBA. As noted above, Heil discloses a system for remote host bus adapter management, comprising: a local host bus adapter (HBA 117, Fig. 1, for example)); a remote host bus adapter (HBA 126, Fig. 1, for example); and switching and routing means (Fiber Channel Backbone 211, Fig. 1, for example) for communicatively coupling the local host bus adapter (HBA 117, Fig. 1, for example) and the remote host bus adapter (HBA 126, Fig. 1, for example). Fibre Channel uses the Gigabit Ethernet physical layer to provide both connection-oriented and connectionless services (see definition of Fiber Channel, previously cited).

Heil does not disclose the use of Fusion-MPT for the PCI message request. In Heil, the PCI message request (I/O request in Heil, for example) is received by the local host bus adapter 117 from software of the local host 100 via PCI bus interface provided by Host to PCI Bus Bridge 115 connected to PCI Bus 116.

However, the use of Fusion-MPT is old and well-known as evidenced by LSI Logic's Fusion-MPT. Fusion-MPT architecture encompasses LSI Logic's Fusion-MPT firmware architecture, LSI Logic's SCSI hardware architecture, LSI Logic's Fibre Channel hardware architecture, and the operating system level drivers that support these architectures. Fusion-MPT architecture has the unique feature of having a single device driver that supports both Fibre Channel and SCSI. LSI Logic's Fusion-MPT architecture is designed to support 64-bit architectures with 64-bit PCI and 64-bit PCI-X interfaces for high host side performance. Fusion-MPT architecture is modular and readily extensible to other host interface architectures as they emerge. Fusion-MPT technology delivers higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Fusion-MPT for the PCI message request in the host interface architecture of Heil, as taught by LSI Logic's Fusion-MPT, for the purpose of providing the HBA architecture of Heil with higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design.

With regard to claim 20, it is clear that transmission of the encapsulated FC packet occurs over an FC link or FC Backbone 121.

With regard to claim 21, it is clear that the encapsulated FC packet is used by the local host bus adapter 117 to configure the directory and update directory related to the remote host bus adapter 126.

With regard to claims 22, 24, and 26, see discussion above, since these claims are directed to the same subject matter that has already been discussed.

Response to Arguments

Applicant's arguments with respect to claims 1-9, 18, 20-22, 24, and 26 have been considered but are moot in view of the new ground(s) of rejection.

Relevant Art

Definitions of Fibre Channel and Host Adapter from Wikipedia are cited as relevant art.

The List of Fibre Channel Standards from Wikipedia is also cited as relevant art.

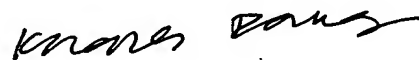
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Dang whose telephone number is 571-272-3626. The examiner can normally be reached on Monday-Friday from 9:AM to 5:PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Rinehart, can be reached on 571-272-3632. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Khanh Dang
Primary Examiner